USDA United States Department of Agriculture | Forest Service | Northeastern Area State and Private Forestry | 180 Canfield Street Morgantown, WV 26505-3101

File Code: 3400
Date: November 30, 2007

Mr. Tom Gentile
Earle Naval Weapons Station
Environmental Department
Building C-23
Colts Neck, NJ 07722

Dear Tom:

On November 13, 2007, USDA Forest Service personnel conducted a gypsy moth egg mass survey at Earle Naval Weapons Station. The purpose of this survey was to determine gypsy moth population densities and to assess the potential for defoliation in 2008.

Gypsy moth survey plots were randomly selected based upon available host trees (oak species), size of sample area and uniformity between egg mass counts. At each sample point, a 1/40th acre fixed radius plot was established. The plots consisted of a tally of all the new (2007) egg masses observed on the overstory trees, understory vegetation, ground litter and duff. The total number of egg masses observed for each plot was multiplied by 40 to determine the number of egg masses per acre. Egg mass lengths were also measured at the plots to determine the overall "health" of the existing population and as a measure of egg mass fecundity.

The location of the survey plots are shown in Figure 1. The summarized results of the survey are presented in Table 1. In brief, egg mass densities at Earle Naval Weapons Station ranged from 0-49,840 and averaged 12,554 egg masses per acre. Overall egg mass lengths tended to be moderate in size, ranging from 12-46 mm and averaging 28 mm. Egg masses larger than 25 mm typically indicate healthy populations. The highest concentrations of gypsy moth are located in the central portion of Earle Naval Weapons Station.

Gypsy moth population levels along with their health varied greatly. Some areas had a small number of egg masses but the egg masses were large in size, some areas had large numbers of egg masses that were moderate to large in size, some areas had large numbers of egg masses that were small to moderate in size while some areas had no egg masses at all.

The survey results indicate that gypsy moth populations are still sufficient to cause heavy defoliation (51-100 percent) at Earle Naval Weapons Station in 2008 (Figure 2).

This defoliation prediction is further supported when egg density is also used as a means of estimating gypsy moth population densities. Moore and Jones (1987) found that estimating the mean fecundity would increase the precision of gypsy moth density estimates and that a linear

relationship exists between egg mass length and fecundity. Further work by Liebhold et al., (1993) demonstrates that the product of the mean egg mass length (mm) and egg mass density provides a more precise means of estimating population densities and predicting defoliation. Using Liebhold's model, Figure 3 shows how this information can be used to correlate the predicted defoliation of an area. Accordingly, the estimated egg mass density of 16,838 masses per acre (average egg mass density in the central portion of Earle) x 28 mm (average egg mass length) translates to a projected defoliation level of about 95 percent (heavy defoliation). Because egg mass densities and host type are not evenly distributed, actual defoliation will vary from tree to tree but will be predominately heavy throughout this area. Very little, if any, defoliation is likely elsewhere at Earle Naval Weapons Station in 2008.

It has been a pleasure working with you over the last 20 years. Enjoy your retirement to the fullest!

Please call me at 304-285-1555 if you have any questions regarding this egg mass survey or this letter.

Sincerely,

Rodney L. Whiteman

RODNEY L WHITEMAN
Forester
Forest Health Protection

Enclosures

Cc: Joe Zoltowski, NJDA
George Koeck, NJDF
Noel Schneeberger, AO
Robert Lueckel, MFO

RLW/blm

Table 1 – Gypsy moth egg mass survey results at Earle Naval Weapons Station, November 13, 2007

Plot number	Number em/acre	em size (mm)	Plot number	Number em/acre	em size (mm)
1	880	40,24,30	21	1,000	42,46,44
2	0	—	22	40	—
3	7,400	34,32,16	23	160	—
4	40	—	24	40	—
5	0	—	25	0	—
6	0	—	26	0	—
7	0	—	27	0	—
8	0	—	28	21,720	30,36,26
9	1,080	26,42	29	16,480	40,26,26
10	20,320	16,22,24	30	12,400	24,16,12
11	4,560	30,40	31	46,760	36,44,30
12	21,560	26,24,22	32	34,880	26,24,22
13	48,320	12,18,14	33	49,840	36,26,26
14	24,960	15,28,20	34	10,080	16,20,20
15	33,720	22,26,32	35	13,720	14,16,20
16	16,280	20,20,16	36	0	—
17	5,440	32,34,36	37	1,120	24,30,30
18	23,400	40,30,26	38	24,400	24,30,32
19	23,440	30,22,24	39	11,440	36,20,36
20	14,120	28,30,32			

em/acre range = 0-49,840
em/acre average = 12,554

em size range (mm) = 12-46
em size average (mm) = 28

REFERENCES

Liebhold, A.M., Simons, E.E., Sior, A., and Unger, J.D., 1993. Forecasting defoliation caused by the gypsy moth from field measurements. Environ.Entomol. 22(1): 26-32.

Moore, K.E.B. and Jones, C.G. 1987. Field estimation of fecundity of gypsy moth (Lepidoptera Lymnatriidae). Environ. Entomol. 16: 165-167

Figure 1. -- Gypsy moth egg mass survey plot locations at Earle Naval Weapons Station on November 13, 2007.

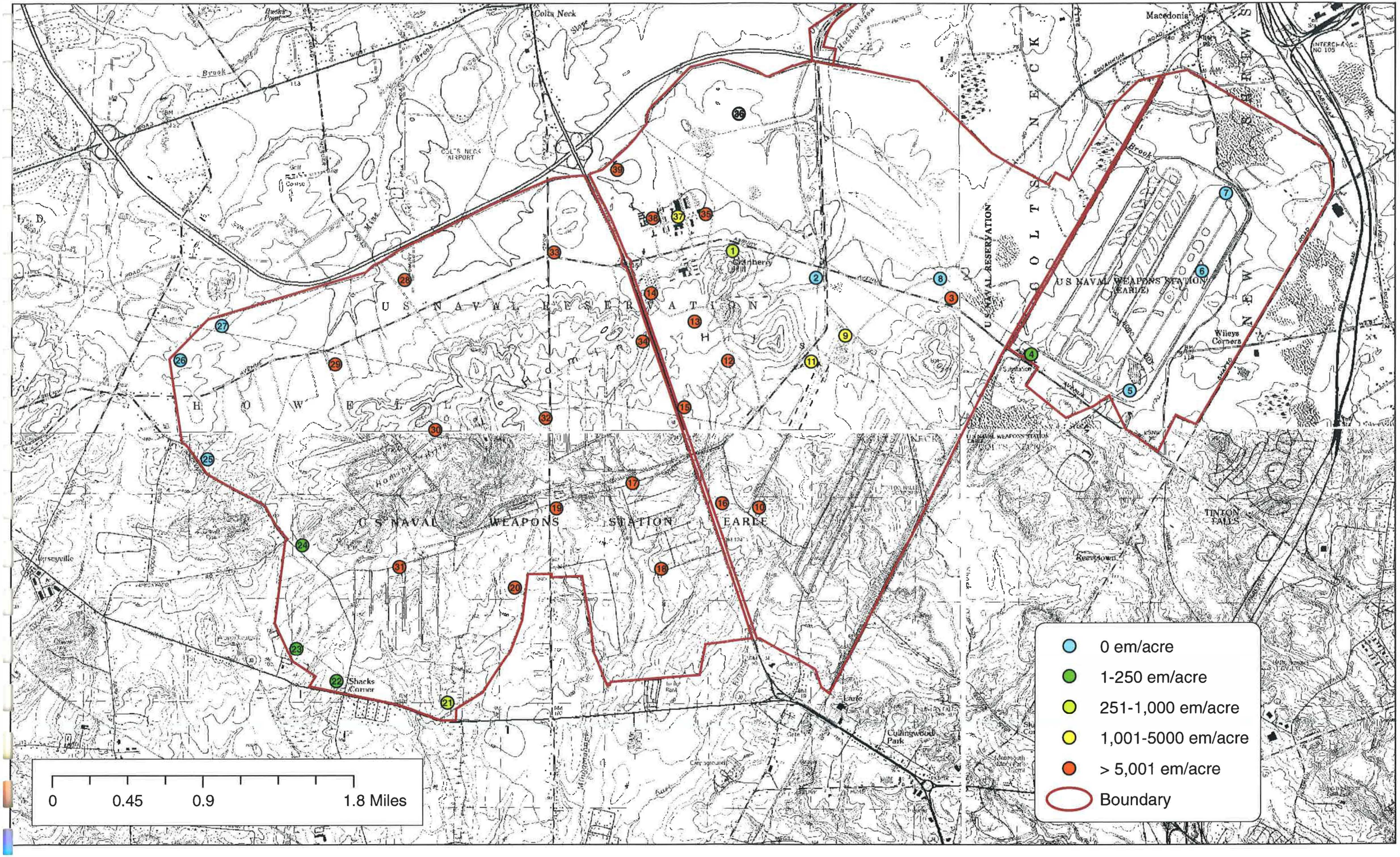

Figure 2. -- Area where defoliation is likely at Earle Naval Weapons Station.